

KIBRIK, B.S.; NEFEDOV, V.B.

Change in external respiration following removal of a lobe of
the lung in tuberculosis patients. Probl.tub. no.6:87-91 '61.
(MIRA 14:9)

1. Iz khirurgicheskogo otdeleniya (zav. - chlen-korrespondent
AMN SSSR prof. I.K. Bogush) Instituta tuberkuleza AMN SSSR (dir. -
chlen-korrespondent AMN SSSR prof. N.A. Shmelev).
(TUBERCULOSIS) (RESPIRATION) (LUNGS—SURGERY)

NEFEDOV, V.B., kand.med.nauk; ZHILIN, Yu.N.

Gas content of the arterial blood during pulmonary surgery on tuberculosis patients. Probl. tub. 42 no.3:18-23 '64.

(MIRA 18:1)

1. Khirurgicheskaya klinika (zav. - deystvitel'nyy chlen AMN SSSR - prof. I.K.Bogush) i Sentral'nogo instituta tuberkuleza (direktor - deystvitel'nyy chlen AMN SSSR prof. N.A.Shmelev) Ministerstva zdravookhraneniya SSSR, Moskva.

SHLENSKIY, O.F.; NEFEDOV, V.D.; OSIPENKO, N.M.

Determination of the strength characteristics of plastics at
elevated temperatures. Plast.massy no.7:52-55 '63. (MIRA 16:8)
(Plastics--Testing)

NEFEDOV, V.D.; ROZMAN, I.M.; RYUKHIN, Yu.A.; MAKOVEYEV, Ye.A.

Isotope effects during the reaction (n, 2n) in antimony.
Radiokhimiia 5 no.5:643-646 '63. (MIRA 17:3)

NEFEDOV, V.D.; ZAYTSEV, V.M.; TOROPOVA, M.A.

Chemical changes taken place during the processes of β -decay.
Usp.khim. 32 no.11:1367-1396 N '63. (MIRA 17:3)

1. Leningradskiy gosudarstvennyy universitet imeni Zhdanova.

ВНЕДОВ, В.Д., инжener.

Water resources in pavilions of Soviet Baltic States at the All-Union Agricultural Exhibition. Gidr. i mel. 6 no.8:22-29 Ag '54.

(MLBA 7:9)

(Baltic States--Water resources development)(Water resources development--Baltic States) (Moscow--Agricultural exhibitions) (Agricultural exhibitions--Moscow)

Perestroika in the USSR

SMIRNOV, Aleksey Vladimirovich, kand.tekhn.nauk; ~~SMIRNOV~~, Yevgeniy Dmitriyevich, inzh.; ORLOVA, V.P., red.; ZUBRILINA, Z.P., tekhn.red.; GUREVICH, M.M., tekhn.red.

[Reconstruction of drainage systems] Pereustroistvo osushitel'nykh sistem. Moskva, Gosizd-vo sel'khoz. lit-ry, 1957. 109 p.
(Drainage) (MIRA 11:2)

NEFEDOV, V.D.

99-3-5/7

SUBJECT: CSR/Water Economy in Czechoslovakia

AUTHOR: Nefedov, V.D., Engineer and Rozin, V.A., Candidate of Mechanical Sciences.

TITLE: Water Economy in CSR (Vodnoye Khozyastvo Chekhoslovaki)

PERIODICAL: Gidrotekhnika i Melioratsiya, 1957, Issue # 3, pp 39-51, (USSR).

ABSTRACT: In charge of all measures pertaining to the CSR water economy is the Central Administration for Water Economy in PRAGUE, which enjoys the status of a ministry. This ministry has 2 departments: a. Department for water supply and sewerage and b. Department for water ways and melioration. Attached to the Central Administration are the following institutes:

1. The Scientific-Research Institute at Prague, with branch offices in Brno and Bratislava.
2. The Central Office for the Development of Water Resources and Capital Investments.
3. The Hydro-Meteorological Institute.
4. The Planning Institute "Gidroprojekt", with branch offices in Brno, Blansko and Bratislava.
5. The Planning Institute "Vodprojekt", with branch offices

Card 1/3

TITLE:

99-3-5/7
Water Economy in CSR (Vodnoye Khozyastvo Chekhoslovakii)
in Prague, Brno and Bratislava.

The diversity of topographic, climatic and soil conditions of the country call for rather different measures with regard to reclamation, irrigation, flood and erosion control.

The mountainous regions offer potential resources for the development of water power, at present estimates, for an output of approx 3 million kw.

62 % of the meliorated acreage is drained by means of underground pipelines, whereas open collecting ditches are seldom used. In order to overcome the regional shortage of drinking water, underground drainage water is collected in open basins, measuring approx 1,000 sq m.

Approx 40,000 hectares are under irrigation, of a total acreage of 1.5 million hectares, which are suitable for irrigation.

Extensive work is being done at the regulation of mountain streams, especially at the MOHELNICE and OSTRAVICE Rivers. Besides stone spillways the banks were reinforced by the planting of willows.

Card 2/3

TITLE:

99-3-5/7
Water Economy in CSR/Vodnoye Khozyastvo Chekhoslovakii

Great attention is given to scientific research of water resources. The institutes and laboratories are well equipped, and operate numerous experimental stations.

The article contains 10 figures and 1 table

ASSOCIATION: Scientific Research Institute for Hydraulic Engineering at Prague.

PRESENTED BY:

SUBMITTED:

AVAILABLE: At the Library of Congress

Card 3/3

AUTHOR: Nefedov, V.D., Engineer and Lapidovskiy, K.M.,
 Engineer.

TITLE: Conference on Problems of Drainage by Means of Underground
 Drains" (Soveshchaniye po voprosam osusheniya zemel' s
 primeneniym zakrytogo drenazha)

PERIODICAL: "Gidrotehnika i Melioratsiya", 1957, Nr 9, pp 57-64. (USSR)

ABSTRACT: R.S. Kuchumov Deputy Minister of the Ministry of Agriculture
 of the USSR (Ministerstvo sel'skogo Khozyaystva SSSR), opened
 a conference in Riga in June 1957, which was attended by
 representatives of the Baltic Republics, the RSFSR, the Ukrain-
 ian SSR and the USSR. Problems of melioration were discussed,
 and lectures were held on different drainage systems. Kuchumov
 stressed the importance of underground drainage systems, success-
 fully applied to podzolic soils with abundant precipitation in
 the Baltic republics for some time. The tasks to be accomplish-
 ed now in the field of melioration was to repair the existing
 underground drainage systems, and to replace the mole-type and
 open ditch-type drains by subsurface drains. Rationalization
 of planning and research work as well as higher efficiency at
 the installation of drainage systems is urgently needed because

Card 1/2

99-9-9/9

Conference on Problems of Drainage by Means of Underground Drains".

300-350 melioration projects have to be carried out in the Baltic republics every year. Satisfactory progress was reported by the Latvian representative Berzins, who stated that the drained acreage increased from 23 % in 1914 to 45.8 % in 1957. As in Latvia, the installation of underground drainage systems was started in 1956 on a large scale in the Lithuanian SSR. Slower progress was made in the Estonian SSR on account of stony soils. Much has to be done in order to fully mechanize the installation of drainage pipes, for only 2 out of 8 basic operations are mechanized at present. The article contains 1 table.

ASSOCIATION: Ministry of Agriculture of the USSR (Ministerstvo sel'skogo khozyaystva SSSR)

AVAILABLE: Library of Congress

Card 2/2

NEFEDOV, V.D.

AUTHOR: Nefedov, V.D., Engineer

99-58-3-11/12

TITLE: Melioration in England (Melioratsiya zemel' v Anglii)

PERIODICAL: Gidrotekhnika i Melioratsiya, 1956, # 3, pp 51-61 (USSR)

ABSTRACT: This is a detailed report of a visit by a group of Soviet melioration workers of the Baltic republics to England to study subsurface drainage.

AVAILABLE: Library of Congress

Card 1/1

99-58-4-3/7

AUTHORS: Bolotova, N.P.; Vinokur Ya.Ye.; Girshkan, S.A.; Koklyanov, A.F.; Kundzich, M.M.; Nefedov, V.D.; Offengenden, S.R.; Pishchikov, R. S.; Poslavskiy, V. V.; Tomilov, V. S.; Sharov, M. A.; Shtarev, Ya. K.; Shubladze, K. K.

TITLE: Means of Raising the Technical Level and Lowering the Construction Cost of Irrigating and Meliorating Systems (Puti povyshe-niya tekhnicheskogo urovnya i snizheniya stoimosti stroitel'stva orositel'nykh, osushitel'nykh i obvodnitel'nykh sistem)

PERIODICAL: Gidrotekhnika i Melioratsiya, 1958, # 4, pp 17-39 (USSR)

ABSTRACT: A general review of past achievements and future tasks in the field of irrigation and melioration is given. The main deficiencies in the field are: insufficient mechanization of construction work, a shortage of excavating machines and other construction equipment, late deliveries of spare parts for machines and a too wide dispersal of funds over a multitude of enterprises. The main shortcomings at the planning stage are: insufficient use of means to cut down filtration losses of water in the canals; insufficient utilization of sprinkling; insufficient development of drainage systems, a careless leveling of irrigated fields, the most important factor in an

Card 1/3

99-58-4-3/7

Means of a Raising the Technical Level and Lowering the Construction Cost
of Irrigating and Meliorating Systems

economical use of water. During the 6th 5-year plan, the drainage system in the south-western parts of the Belorussian SSR, in the Poles'ye part of the Ukrainian SSR, and in other parts of the USSR, is to be greatly developed. Only 8,4 million hectares out of a total of 200 million hectares of marshes or marshy soils were being drained at the beginning of 1957. More than 4 million of these undrained hectares are used as natural meadows and pastures with low yields. The article also recommends to replace the system of open drainage ditches by subsurface drains.

During the 6th 5-year plan 81,1 million hectares will be watered by new wells, reservoirs, artificial lakes and spring water. Many sheep-breeding farms in Uzbekistan will install electric pumps, until now impossible due to the shortage of needed equipment. In 1957 production of hydraulic equipment lagged considerably behind requirements. The article lists the various projects to be constructed in various republics. The melioration works will cover an area of 13 million hectares in the Belorussian and Ukrainian SSR; the acreage of arable land will be increased by 3,8 million

Card 2/3

99-58-4-3/7

Means of a Raising the Technical Level and Lowering the Construction Cost
of Irrigating and Meliorating Systems

hectares.

There are 8 photos and 1 table and 4 maps.

AVAILABLE: Library of Congress

Card 3/3

NEFEDOV, V. D., insh.

General plan for diversified use and preservation of water resources in the U.S.S.R. Gidr. 1 mel. 15 no.3:61-64. Mr '63.
(MIRA 16:4)

1. Vsesoyuznyy gosudarstvennyy proyektno-isskatel'skiy i nauchno-issledovatel'skiy institut Ministerstva sel'skogo khozyaystva SSSR.

(Water resources development)
(Water conservation)

NEFEDOV, V.D.; TOROPOVA, M.A.; KRICHATSKAYA, I.V.; KESAREV, G.V.

Separation of phenyl derivatives of arsenic and germanium by
means of partition paper chromatography. Radiohimia 6
no. 1:112-113 '64. MIRA 17:6.

NEPEDOV, V.D.; VOBETSKY, M.; SINOTOVA, Ye.N.; BORAK, I.

Isomeric effects during the α -decay of RaE in the α , β , γ derivatives of bismuth. Radiokhimiya 7 no.5:627-6.8 '64.

(MIRA 28.70)

NEFSEDOV, V.D.; VOBOINIK, M.; BOLEK, Y.

Synthesis of α -xylylene derivatives of 1,2-dichloroethane and 1,2-dibromoethane

Decay of Rn^{222} in the α -xylylene derivatives of 1,2-dichloroethane

Radiokhimiya "No. 5" 1969, 9, 106.

(X-18-10)

L 17372-66 EWT(m)/EWP(t) DIAAP/IJP(c) JD

ACC NR: AP6004508

SOURCE CODE: UR/0186/65/007/005/0629/0630

AUTHOR: Myrin, A. N.; Nefedov, V. D.; Kirin, I. S.; Leonov, V. V.; Zaytsev, V. M.; Akulov, G. P.

ORG: none

TITLE: Formation of fluorine-containing compounds of xenon during β -radiation of I^{131} contained in iodine pentafluoride ⁵¹_B ¹⁹₂₇

SOURCE: Radiokhimiya, v. 7, no. 5, 1965, 629-630

TOPIC TAGS: xenon, fluorine, beta radiation, iodine, elemental halogen, fluorine compound, radioisotope

ABSTRACT: Free Xe^{131} was accumulated by bubbling helium for 8 hours at room temperature through a liquid I^{131}F_5 . The origin of this free Xe^{131} is traced to the intermediate formation of a molecular ion $[\text{Xe}^{131}\text{F}_5]^+$. After removal of free Xe^{131} , the β -radiation material was hydrolyzed and the products of hydrolysis were subjected to reduction with various reducing agents. In the course of treatment with HCl the xenon-fluorine compounds were reduced to free xenon. No free xenon was obtained when KJ, hydrazylamine, or Fe^{2+} were used as reducing agents. It was found that

UDC: 546.295'16 : 541.28 : 546.155'161

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2

L 17372-66

ACC NR: AP6004508

the xenon-fluorine compounds are more volatile than the starting $J^{131}F_5$.

/Editor's note: J is the Russian periodic symbol for iodine.7

SUB CODE: 07/

SUBM DATE: 28Dec64/

(ORIG REF: 003/

OTH REF: 003

Card 2/2 not

L 17371-66 KWT(m)/ZWP(t) DIAAP/IJP(e) JD
ACC NR: AP6004509 SOURCE CODE: UR/0186/65/007/005/0631/0632

AUTHOR: Murin, A. M.; Mefedov, V. D.; Kir'n, I. S.; Grachev, S. A.; Gusev, Yu. K.; Saykov, Yu. P.

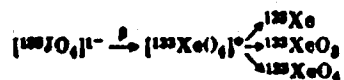
ORG: none

TITLE: Formation of oxygen-xenon compounds during β -radiation of I^{133} incorporated in potassium periodide ¹⁹ ₁₉ ³⁹ _B

SOURCE: Radiokhimiya, v. 7, no. 5, 1965, 631-632

TOPIC TAGS: xenon, oxide formation, beta radiation, iodine, radioisotope

ABSTRACT: Xenon oxides (XeO_4 and XeO_3) were prepared by β -radiation of potassium periodide containing radioactive I^{133} isotope according to the following scheme:



The preparation procedure was as follows: helium gas was bubbled for 30 minutes at

UDC: 541.28 : 546.295

Card 1/2

L 17371-66

ACC NR: AP6004509

0

a rate of 26 ml/min through a solution of $KJ^{133}O_4$ and KJ^{133} in 0.002 normal H_2SO_4 to remove free xenon. The elemental iodine was removed from the gas stream by passing helium through a KOH-absorber. The xenon oxides were trapped on AG-5 activated carbon at liquid nitrogen temperature. The quantity of trapped xenon-133 was measured using an AI-100-1 analyzer. It was found that XeO_4 is unstable in acidic media and decomposes to XeO_3 . [Editor's note: J is the Russian periodic symbol for iodine.]

SUB CODE: 07/

SUBM DATE: 08Jan65/

ORIG REF: 002/

OTH REF: 005

Card 2/2 not

SECRET [Illegible text]

[Illegible text]

[Illegible text]

NEFEDOV, V. E., MURIN, A. N., KLOKMAN, V. R. and KHLOPIN, V. G.

"Soviet Scientists on Achievement of Equilibrium In Distribution of A Microcomponent between Solid Crystalline Isomorphous Phase and Melted Salt", Izvestiya Akademii Nauk SSSR, Otdeleniya Khimicheskikh, Nauk, No. 2, 1950.

A Digest W-12970, 22 Aug 1950

NEFEDOV, V. D.

**ENRICHMENT OF RADIOACTIVE ELEMENTS BY THE
METHOD OF RECOIL NUCLEI. A. P. Maria and V. D.
Nefedov. Translated by V. Bonk from Uspekhi Khim. 51,
135-151 (1982). 31p. (AEKE-Lib/Trans-464)**

Radioactive isotopes obtained by α, γ reactions can be separated by making use of radioactive recoil. In some chemical compounds, capture of a neutron by a nucleus may provide the atom with enough recoil energy from γ emission to sever the chemical bonds, making chemical separation of the atom from the compound possible. The basic principles of the method are reviewed. General techniques for separating the isotopes are discussed, and specific separation cases are described. (M.P.G.)

NEFEDOV, V. D.

Chemistry

Crystallization

Card : 1/1

Authors : Nefedov, V. D., and Varshav, M. A.

Title : Investigation of isomorphous co-crystallization of tetraphenyl derivatives of Pb, Sn and Si

Periodical : Zhur. fis. khim. 28, Ed. 6, 961 - 964, June 1952

Abstract : The applicability of the V. G. Khlopov law to systems in which metal-organic compounds (phenyl derivatives) of Pb, Sn, and Si serve as macro- and micro-components, was investigated. Roentgenographic data are presented on the isomorphism for tetraphenyl-Pb, Sn and Si derivatives with an explanation of the isomorphic problem. The determination of the value of fractionation coefficients, for above mentioned systems, by the application of the isomorphic co-crystallization method, is described. Four USSR references. Tables.

Institution :

Submitted : November 29, 1952

NOTE: V. V. D.

AID P - 3167

Subject : USSR/Chemistry

Card 1/1 Pub. 119 - 2/8

Authors : Murin, A. N., V. D. Nefedov, and I. A. Yutlandov (Leningrad)

Title : Preparation and separation of radioisotopes without carriers

Periodical : Usp. khim., 24, 5, 527-574, 1955

Abstract : The cyclotron and uranium reactor serve as sources for the production of radioisotopes without carriers. The cyclotron reactions are discussed in great detail, and various methods of separating the following radioactive elements are given: T, F, C, P, Na, Mg, P, S, Ar, Ca, Sc, V, Cr, Mn, Fe, Co, Cu, Zn, Ga, As, Se, Br, Kr, Sr, Y, Zr, Mo, Te, Ru, Rh, Pd, Ag, Cd, In, Sn, Sb, I, Xe, Cs, Ta, W, Os, Ir, Pt, Au, Tl, Pb, Bi and At. Four drawings, 3 tables, 128 references, 7 Russian (1930-1954).

Institution : None

Submitted : No date

NEFEDOV, V. D.
USSR/Chemistry - Technical books

Card 1/1 Pub. 147 - 22/22

Authors : Starik, I. Ye.; Murin, A. N.; and Nefedov, V. D.

Title : Critique and bibliography

Periodical : Dokl. Akad. Nauk. 29/11, 2110-2110-2111, Nov 1955

Abstract : Critical review is presented of the book by An. N. Nesmeyanov, A. V. Lapitskiy and N. I. Rudenko, entitled, "Derivation of Radioactive Isotopes," published by Goskhimizdat (State Publication of Chemical Literature) in 1954.

Institution :

Submitted :

Nefedov, V. D

USSR/Organic Chemistry - Theoretical and General Questions
on Organic Chemistry

S-1

Abs Jour : Referat Zhur - Khimiya, No 2, 1957, 4234

Author : Nefedov, V.D., Toropova, M.A., Skul'skiy, I.A.
Title : Use of C^{14} in the Study of the Mechanism of Catalytic
Formation of Asymmetrical Ketones

Orig Pub : Zh. fiz. khimii, 1955, 29, No 12, 2236-2243

Abstract : Investigation of the reaction of catalytic formation of ketones over ThO_2 at 430-450° from mixtures of the following composition: A) phenyl acetic acid (C^{14}) + acetic acid; B) acetic acid (C^{14}) + phenyl acetic acid; C) benzoic acid (C^{14}) + acetic acid; D) isobutyric acid + acetic acid (C^{14}); E) valeric acid + acetic acid (C^{14}); F) capronic acid + acetic acid (C^{14}). Activity a of the ketones thus formed was determined directly in the liquid by means of a special attachment to the end-window counter. Per cent a of ketones obtained from

Card 1/2

- 17 -

STARIK, I.Ye.; BATNER, A.P. [deceased]; GROSNIKOV, G.V.; MURIN, A.N.;
STARIK, A.S.; GRENKOVSKAYA, V.I.; KLOKMAN, V.P.; MAMEDOV, V.D.;
LUR'YE, B.G.; ISHINA, V.A.; SMIRNOV, L.A.; YEFIMOVA, Ye.I.;
TOROPOVA, M.A.; SIMONYAK, Z.N.; FRENKELIKH, M.S.; SHCHERBULEVA, Ye.V.,
redaktor; VODOLAGINA, S.D., tekhnicheskiy redaktor

[A collection of practical studies in radio chemistry] Sbornik
prakticheskikh rabot po radiokhimi. [Leningrad] 1956. 210 p.
(MLRA 10:1)

1. Leningrad. Universitet.
(Radiochemistry)

NEFEDOV, V.D.

USSR / Isotopes.

B-7

Abstr Jour : Ref Zhur - Khimiya, No 8, 1957, 26039

Author : V.D. Nefedov, Ye.N. Sinotova, V.I. Katsapov
Title : Enrichment of Radioactive Isotopes of Mercury

Orig Pub : Zh. fiz. khimii, 1956, 30, No 8, 1867 - 1870

Abstract : The enrichment method of isomers Hg^{197m2} (I) and Hg^{197} (II) prepared by the reaction (n, γ) was developed. $(C_2H_5)_2Hg$ (III) free of traces of Br was purified by a repeated distillation in vacuum and irradiated 5 hours by thermal neutrons; first 1 ml of saturated $MnSO_4$ (IV) solution in acetone (V) and, after that, the solution of 0.1 g of $MnMnO_4$ (VI) in 4 ml of V were added to 125 g of the irradiated III; the excess of VI was reduced by adding the saturated solution of IV in V; the precipitate of MnO_2 adsorbed I and II liberated from III in consequence of the recoil at the emission γ -quanta of capture; the contents

Card : 1/2

7
 ENRICHMENT OF RADIOACTIVE ANTIMONY ISOTOPES
 WITH THE AID OF TRIISOBUTYLANTIMONY DIFLUORIDE
 BY THE ATOMIC RECOIL METHOD. V. D. Nefedov and
 A. I. Vilkov (Leningrad State Univ.). Zhur. Fiz. Khim.
 no. 40(4-8)(1986) Sept. (in Russian)
 A method has been developed for the enrichment of ^{124}Sb
 by using $\text{Sn}(\text{C}_2\text{H}_5)_3\text{F}_2$ as the initial compound. The method
 attained an enrichment factor of $\sim 10^3$ with yield of ~ 40
 to 45%. Preliminary studies were made on the forms of
 radioactive antimony in preparation bombarded by slow
 neutrons (Ar-60).

Chem Isotope exchange is inactive in $\text{CH}_3\text{HgBr}-\text{HgBr}-\text{C}_2\text{H}_5\text{OH}$ system. V. D. Beladov, B. N. Shostova, and N. Ya. Prolov (Leningrad State Univ.). *Zhur. Fiz. Khim.* 40, 2260-60 (1966). The isotope exchange in the $\text{CH}_3\text{HgBr}-\text{Hg}^+\text{Br}-\text{C}_2\text{H}_5\text{OH}$ proceeds as a bimol. reaction with an activation energy of 18,200 cal./mol. W. M. Sternberg

NEFEDOV, V. D.

✓ Cocrystallization in systems that contain organic mer-
cury compounds. / V. D. Nefedov and V. I. Katsakov (A. A.
Zhdanov State Univ., Leningrad). *Zhur. Fis. Khim.* 30,
2771-4 (1956); cf. *C.A.* 49, 7364b. — The isomorphous and
leadimorphous co-crystals in systems (a) $C_6H_5HgBr-n$
 $C_6H_5HgBr-alc.$, (b) $C_6H_5HgBr-n-C_4H_9Br-alc.$, and (c) C_6H_5
 $HgBr-HgBr_2-alc.$ was studied for the prepn. of pure compds.
and in the investigation of isotope exchange reactions.
As microcomponents, $HgBr_2$ and C_6H_5HgBr were used.
Preliminary tests showed that the thermodynamic equil.
was reached very rapidly, and the same fractionation const.
(D) was obtained in 16 min. and 14 hrs. crystn. The values
for D obtained for the 3 systems were a: 0.78 ± 0.02 ; b:
 0.97 ± 0.006 ; c: 0.86 ± 0.03 . W. M. Sternberg.

Am. conf.

NEFEDOV, V.D.

SUBJECT USSR / PHYSICS CARD 1 / 2 PA - 1797
 AUTHOR MURIN, A.N., NEFEDOV, V.D., BARANOVSKIY, V.I., POPOV, D.K.
 TITLE The Enrichment of the Isotopes of Iodine, Germanium, Arsenic and Antimony obtained after the Reaction (γ , n).
 PERIODICAL Dokl. Akad. Nauk, 111, fasc. 4, 806-807 (1956)
 Issued: 1 / 1957

The here described experiments were carried out with the synchrotron of the Physical Institute of the Academy of Science in the USSR. The cross sections of the reaction (γ , n) are usually small. Thus, the maximum cross section of the reaction $\text{Sb}^{123}(\gamma, n) \text{Sb}^{122}$ ($E_{\gamma} = 14,8 \text{ MeV}$) is only $0,363 \cdot 10^{-24} \text{ cm}^2$ with an integral cross section of the order 2 MeV.barn, and for the reaction $\text{As}^{75}(\gamma, n) \text{As}^{74}$ it is $\sim 0,8 \text{ MeV.barn}$, and for the reaction $\text{J}^{127}(\gamma, n) \text{J}^{126}$ it is $\sim 2 \text{ MeV.barn}$. Thus the production of preparations with high specific activity requires working out suitable varieties of the SZILARD-CHALMERS method. Works dealing with this field are very few and are cited in this connection. Apart from preparative interest the radiochemical study of the reaction (γ, n) can be essential for the study of the chemistry of hot atoms within the range of high energies, for the energy liberated on the occasion of the reaction (γ, n) exceeds the energy conveyed on the occasion of the reaction (n, γ) by three or more orders. For purposes of enrichment the authors in most cases used element-organic compounds which had formerly been used with success for the enrichment of radio-

MEYDOV, V.D.; SINOTOVA, Ya.N.

~~MEYDOV, V.D.; SINOTOVA, Ya.N.~~
Isotopic exchange of peripheral atoms in the homologous series
of saltlike aliphatic derivatives of mercury. Zhur. teory. khim.
2 no.5:1162-1163 My '57. (MLRA 10:8)
(Chemical bonds) (Mercury organic compounds)

AUTHOR
TITLE

EDITORIAL

ABSTRACT

1. F. V.
MURIN, A. N., NEPELOV, V. D., POPOV, D. K., BARANOVSKIY, V. I.

On the Successive Neutron Capture in Antimony
(O posledovatel'nom neytronnom zakhvate v sur'me-Russian)
Atomnaya Energiya, 1957, Vol 2, Nr 6, pp 553-553 (U.S.S.R.)

On the occasion of the irradiation of a sufficiently intensive neutron flux a twofold neutron capture according to the scheme
 $Sb^{123}(n, \gamma) Sb^{124}(n, \gamma) Sb^{125}(T = 2.7 \text{ Years})$
 $Sb^{124}(T = 60 \text{ Days})$

is possible. By means of the β -decay Sb^{125} goes over into Te^{125m} ($T = 57 \text{ Days}$) and this is the highest isomeric state of the stable Te^{126} . From the samples of the antimony irradiated by neutrons de-
cayed for about one year (for the purpose of a sufficient ac-
cumulation of Te^{125m} in antimony) the authors separated the Te^{125m} .
Stable Te here served as a carrier. The metallic tellurium was se-
parated from the antimony by reduction with tin-dichloride. An im-
portant activity of the Te^{125m} was observed in the separated tel-
lurium. It was identified after the half value period ($57 \pm 4 \text{ days}$)
from the accumulation in the antimony and from the curve of the
absorption of the conversion electrons in aluminum. This curve,
in the way, agrees with those given by G. Friedlander, M. Goldhaber,
J. Scharf-Goldhaber, Phys Rev, 74, 981 (1948). Thus the existence of
a successive (double) capture which develops according to the
scheme given here, may be assumed as an established fact.
Experiments were made to evaluate the cross section of the activation of

USSR/Physical Chemistry - Radiochemistry, Isotopes.

B-7

Abs Jour: Referat. Zhurnal Khimiya, No 2, 1958, 3735.

Author : V.D. Nefedov, M.A. Toropova.

Inst :

Title : Production of Carrier-Free Re^{188} by Method Based on Breakage of Chemical Bonds at β -Dissociation.

Orig Pub: Zh. neorgan. khimii, 1957, 2, No 7, 1667-1671.

Abstract: A rapid method of separating carrier-free Re^{188} using $\text{W}(\text{CO})_6$ (I) was developed. Re^{188} generates at the β -dissociation of W^{187} forming at a successive capture of two neutrons by a W^{186} nucleus. WCl_6 was obtained from WO_3 (irradiated with slow neutrons), after which I was obtained and purified of inorganic Re forms by distillation with steam and sublimation in vacuo. 500 mg of I was dissolved in 10 mlit of chloroform and the solution was aged in order to accumulate Re^{188} . It was extracted with 10 mlit of distilled water, the aqueous layer was

Card : 1/2

-4-

NEFEDOV, V. D.

AUTHORS: Murin, A. N.; Nefedov, V. D.; Haranovskiy; and Popov, D. K.
(Leningrad)

TITLE: Chemical Effects of the Gamma, n Reaction (Khimicheskiye efekty reaktsii)

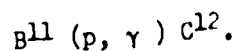
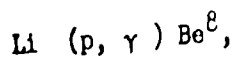
PERIODICAL: Uspekhi Khimii, 1957, Vol. 26, No. 2, pp. 164-175 (U.S.S.R.)

ABSTRACT: During the exposure of various elements by high energy gamma-rays an interaction occurs between the nuclei of the atoms of these elements and the gamma-quanta, accompanied by the emission of one or several nuclear particles. Such reactions are termed photomuclear and have very small cross sections (of the order $0.1-0.001 \text{ } ^{-24} \text{ cm}^2$). The gamma, n reaction is the best studied and generally has the largest section compared to all other photomuclear reactions. Radioactive isotopes with a shortage of neutrons form from this reaction, disintegrating for the most part by way of β^+ disintegration or K-capture; many of these isotopes may be used as radioactive indicators. Study of photomuclear reactions began in the mid-1930s, and the intensive and thorough investigation of photodisintegration is now being conducted.

Card 1/5

Chemical Effects of the Gamma, n Reaction

A great step ahead was the application (in studies on the photomuclear reactions) of gamma emission originating during the impingement of Li and B protons according to the reactions:



The invention of electron accelerators (betatrons, synchrotrons) made possible the derivation of gamma emission of any energy up to 10^9 eV. More than 100 radioactive isotopes have been obtained from the gamma, n reaction but only 12 studies have been published since 1950 on the chemical effects associated with photomuclear reactions.

The author next presents general data on photomuclear reactions, introducing the concept that $E_{\text{thresh}} (E_{\text{nop}})$ (Threshold of photomuclear reaction) in order to separate the neutron from the nucleus, must be somewhat greater than Q_n (the bond energy of the neutron). He develops an equation for the energy of emission of the atom (E_M) in which M = atomic mass, E_γ = energy of the gamma quantum, m = neutron mass, Q = energy of nuclear reaction, c = speed

Card 2/5

Chemical Effects of the Gamma, n Reaction

germanium, iodine, antimony and arsenic. Table 3 shows (based partly on data from a study of R. B. Duffield and A. Calvin [76] the holding for the gamma, n reaction and the n, gamma reaction in γ , in which such irradiating preparations as crystals of salicylaldehyde-ortho-phenylene diimine and a solution of same in pyridine are applied. It follows from Table 3 that, depending on irradiation conditions, a considerable part of radioactive atoms is held in the form of the original compound. F. S. Rowland and W. E. Libby (81) studied the distribution of radioactive carbon originating from a reaction of Cl_2 (γ , n) Cl_1 between CO and CO_2 during irradiation of liquid and solid carbon dioxide, solid $NaHCO_3$ and water solutions of $NaHCO_3$ and Na_2CO_3 .

Results of their tests are shown in Table 4 which shows that the irradiation of solid samples leads to the condition that Cl_1 is evenly distributed between carbon monoxide and carbon dioxide. However, the Rowland-Libby results do not agree with those of Z. J. Sherman and K. J. McCallum (82) which are shown in Table 5 based on their study of the radiocarbon distribution obtained in the irradiation by gamma-rays of sodium carbonate. W. J. Edwards and K. J. McCallum (83) studied the chemical composition of Cl_1 originating with the irradiation of sodium bicarbonate and calcium bicarbonate by gamma-rays with a maximum energy equivalent to 23 MeV. The samples were irradiated for about 10 minutes under an intensity of gamma rays in the range of 1000-2000 roentgens/minute; results are portrayed in Table 6.

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Chemical Effects of the Gamma, n Reaction

of light, and θ = the angle between the trajectories of the emitted neutron and the incident photon. The energy of nuclei of emission obtained in a gamma, n reaction is great and exceeds by far the energy of chemical bond of the atom in a molecule of any compound. The interaction of heavy high energy particles with surrounding media (solution, crystals) and the concomitant chemical changes are of great practical and scientific interest. The few studies made on this subject can be classified under two groups: 1. studies on enrichment of radioactive isotopes and 2. studies on the chemical state (of atoms) originating from the gamma, n reaction. (The author gives much detail under these groups; see explanation of tables 2-6 below, and contributions of personalities).

Table 1 presents thresholds of reaction for various nuclei and has 9 columns giving such information as atomic mass and number, product of reaction, half-life period, Ethresh etc. Table 2 lists elements with their corresponding compounds, reactions, methods of enrichment, output in %, and enrichment factors. The elements listed are

Card 3/5

Chemical Effects of the Gamma, n Reaction

Figs. 1, 2, and 3 respectively present the following: 1. section of the gamma, n reaction as a function of the energy of the gamma-quanta. 2. dependence of the output P_{30} (R) and run of the nuclei of emission (p) upon the maximum energy of retarded radiation. 3. effect of 10 minute heating at various temperatures upon C^{11} distribution: (1) carbonate; (2) oxalate, glycolate, and glyoxylate.

The investigations surveyed in this paper exhaust the studies to date in the field of the chemical changes which accompany photoneutron reactions. There are 83 references, 10 of which are Slavic.

ASSOCIATION: Irradiation of preparations was conducted in a synchrotron of the Physical Institute imeni Lebedev of the Academy of Sciences of the USSR.

PRESENTED BY:

SUBMITTED:

AVAILABLE:

Card 5/5

NEE 120V V.D

Production of $\text{In}^{115\text{m}}$ without a carrier from the In^{115} irradiated with neutrons by using metalloorganic compounds. V. D. Stetsko, G. P. Leizer, E. N. Bogovskiy, and M. A. Kozlov, (A. A. Zhukovskiy State Univ., Leningrad), *Dokl. Akad. Nauk SSSR*, 21, 354-355 (1957). — The production of a long-lived nuclear isomer $\text{In}^{115\text{m}}$ was based on the production of In^{115} , its conversion to $\text{Sn}^{115}\text{Ph}_3$ and $\text{Sn}^{115}\text{Ph}_2\text{Cl}$. The In^{115} was obtained by shaking an ether soln. of $\text{Sn}^{115}\text{Ph}_2\text{Cl}$ with 0.1N HCl, the sepn. of the water layer, its purification from the triphenyl chloride by extg. 3 times with pure ether, the elimination of ether by boiling, and the In_2S_3 by pptn. with H_2S . The analysis indicated 105.7% In^{115} yield, which proved a quant. sepn. if the exptl. errors were considered. W. M. Steinberg.

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NEFEV V.D.

Chemical state of radium E produced by the disintegration of radium D which enters into the composition of some phenol derivatives. V. D. Nefedov and V. I. Andreyev (Leningrad State Univ., Leningrad), *Zhur. Fiz. Khim.* 3, 563-72 (1957). The chem. form. is studied of Ra E produced by radioactive disintegration of Ra D in $(Ra D)_2H_2Cl$ and $(Ra D)_2Ph$, $(Ra D)_2Pb$; Ra E is Pb^{2+} . The chem. state of the daughter-form was found experimentally to depend on the form of the parent element and the disintegration conditions. The β -disintegration of the Bi^{214} component of metal-org. compds. can be used for the synthesis of Pb^{214} compds. of high specific activity, and a simple and convenient prepa. for Pb^{214} derivatives was outlined.

W. M. Sternberg

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4E3

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Handwritten: *see book V.D.*

...ation of the chemical state of thorium C in the
... of thorium B which enters into the com-
... of some phenyl derivatives. V. D. Nekodov and
... (A. A. Zhigalov State Univ., Leningrad),
... Khim. 11, 98-99 (1957), 13, 100-101 (1958).
... thorium Th C (α - Tl^{2+}) formed in the decay of
... $Tl^{2+} = Pb^{2+} = Pb^{2+}$ in $Pb^{2+}(Ph)_2$ and $Pb^{2+}(Ph)_2Cl_2$ is in-
... the Bi^{2+} γ -ray emission energy is insufficient
... the destruction of the mole. of the parent substance, and
... the destruction of the mole. is caused by an internal disin-
... as proved by a satisfactory agreement between
... the internal conversion coeff. of the γ -line with an energy of
... 1.80 MeV, and the Bi^{2+} accumulation in the soln.
... 1.80 MeV. A radiochemically pure Bi^{2+} deriv. of high
... activity was prepd. from $Pb^{2+} Ph$ derivs., and radio-
... ally pure Tl^{2+} deriva. from Bi^{2+} deriva.
W. M. Sternberg

NEFE DOV, V. D.

AUTHORS: Nefedov, V. D., Izrael, M. A.
 TITLE: Use of Carbonyls for the Isolation of the Radioisotopes
 Cr^{51} , Mo^{99} , W^{187} , Tc^{99m} and Re^{188} . Izotopizatsiya
 karbonylov dlya vydeleniya radioizotopov Cr^{51} , Mo^{99} , W^{187} ,
 Tc^{99m} i Re^{188} .
 Concentration of Cr^{51} , Mo^{99} and W^{187}
 (Kontsentrirvaniye Cr^{51} , Mo^{99} i W^{187}).
 PERIODICAL: Zhurnal Neorganicheskoy Khimii, 1968, Vol. 3, Nr. 1,
 pp. 175-180 (USSR)

ABSTRACT: When stable nuclei are irradiated by thermal neutrons the
 latter are captured by the nuclei of stable isotopes. The
 reaction (n, γ) takes the greatest part in this process. The
 radioactive isotopes originating in this process have
 a neutron excess and generally decompose in consequence of
 β -irradiation. Since the capture cross-section for this
 reaction generally is sufficiently large a great quantity of
 extremely valuable radioactive preparations can be produced.

Card 1/4

Use of Carbonyls for the Isolation of the Radioisotopes

Cr⁵¹, Mo⁹⁹, W¹⁸⁷, Tc^{99m} and Re¹⁸⁸

Concentration of Cr⁵¹, Mo⁹⁹ and W¹⁸⁷

by means of the beforementioned reactions. As the chemical characteristics of the isotopes formed at this kind of nuclear transformation and of the inactive atoms of the target are almost the same, their separation is connected with difficulties. In the author's opinion hexacarbonyls of Cr, Mo and W are the most suitable compounds being used for the enrichment of radioactive isotopes. Virtually they are the only steady crystalline compounds of these elements in which the metal is bound to the remaining part of the molecule by a covalent bond. Furthermore, hexacarbonyls are easy to be purified and are rather resistant against irradiation. Since all carbonyls are soluble in water and in organic solvents, their applicability for extraction of the abovementioned isotopes was presupposed. The carbonyls were shortly irradiated with neutrons. Thereby the radioisotope Cr⁵¹, Mo⁹⁹ and W¹⁸⁷ (after decay of the short-lived isotopes Cr⁵⁵ and Mo^{99m}). The crystals of the carbonyls were dissolved in chloroform and the isotopes were extracted by water. Table 1 shows the concentration

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Use of Carbonyls

Cr⁵¹, Mo⁹⁹, W¹⁸⁸

Concentration of Cr⁵¹

factors 10^{-4} , 10^{-5} and 10^{-6} as well as the yield (10% at 10^{-4}). The yields decrease according to the sequence $Cr^{51} > Mo^{99} > W^{188}$ which may be explained by the different degree to which the γ -quanta of the capture of these elements are converted. The concentration factor, on the contrary, tends towards an increase from W to Cr. This dependence can be explained by the different chemical stability of these carbonyls on the condition of their isolation. Isolation of Mo^{99m} and Re^{188} without stabilizer. Also in this case $Mo^{99m}(CO)_6$ and $W^{188}(CO)_6$ can be used for the concentration of radioisotopes which form in the decay of Mo^{99} - and W^{188} isotopes. As initial preparation of the latter corresponding carbonyls with a content of the isotopes Mo^{99} and W^{188} are synthesized from the respective oxides with high specific activity. In the decomposition chains Mo^{99m} and Re^{188} form, too. From crystals of the carbonyls in question or from chloroform solutions the latter isotopes were extracted by means of water. It was found out from their

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Use of Carbonyls for the Isolation of the Radioisotopes
Cr⁵¹, Mo⁹⁹, W¹⁸⁷, Tc^{99m} and Re¹⁸⁸

Concentration of Cr⁵¹, Mo⁹⁹ and W¹⁸⁷

Half-life figures show that both isotopes were obtained without carrier and were radiochemically pure. The predominant stabilization form of radioactive chromium isolated out of a cold reform solution of Cr⁵¹CO₃ by water extraction is trivalent. The radioactive W¹⁸⁷ which remains unextracted by water belong to the initial compound containing hexacarbonyl. This may also be assumed with Cr and Mo. After a water extraction Re¹⁸⁸, accumulated in the tungsten-hexacarbonyl crystals, remains in a larger amount than in the case of concentration in chloroform solutions. The proportion of Re¹⁸⁸ decay which leads to Re^{188m} amounts to 16.7% of the total number of transformations. There are 6 figures, 1 table, and 14 references, of which are given.

SUBMITTED: June 19, 1977

AVAILABLE: Library of Congress

Card 4/4

NE 12 20 1 1

AUTHORS: Murin, A. N., Nefedov, V. D., Sinotova, Y. N., Larionov, O. V.

TITLE: The Separation of the Nuclear Isomers of Tellurium, Mercury and Tin (Razdeleniye yadernykh izomerov tellura, rtuti i olova)

PERIODICAL: Zhurnal Neorganicheskoy Khimii, 1968, Vol. 13, No. 1, pp. 181-187 (USSR)

ABSTRACT: After giving a review of the separation methods of the nuclear isomers of tellurium (references 1,2) and after their discussion the authors chose dimethyl-dinitrate of tellurium as the initial compound for the separation of the nuclear isomers of Tl^{27} . It must be expected that the transition to an intermediate level will occur by means of an internal conversion and for this reason will be accompanied by a disturbance of the chemical binding of tellurium in the initial compound. Therefore a considerable portion of the nuclei of Tl^{27} will be present as most simple anionic forms in the ground state in the preparation dimethyl-dinitrate of tellurium. Tl^{27} in its ground state was isolated

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The Separation of the Nuclear Isomers of Tellurium,
Mercury and Tin

by means of the adsorption of these anorganic forms by ferric hydroxide. The extraction with isopropyl ether from 9 n HCl was intended for the removal of the an isotropic carriers, that is to say, iron. From the decay curve of the lowest isolated isomer (figure 1) follows, that only one tellurium isotope was existent, which had a half life of 9.3 hours. This testified to the presence of only the lowest isomer in the preparation. The yield of Tel^{127} was determined to 80%, if it was accumulated in crystals, and to 94%, if it was accumulated in a solution. The latter value is in good correspondence with the known fact, that the isomeric transition in Tel^{127} is converted to practically 100%. This implies, that the initial molecule is destroyed by every process of isomeric transition, which is accompanied by an internal conversion. The yield is somewhat lower, if accumulation takes place in crystals. The isolated radioactive Tel^{127} predominantly takes its four-valent form and only 6 % of it take the six-valent one. This method possesses several advantages in comparison to the ones known hitherto (reference 1). If mercury is irradiated with neutrons according

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The Separation of the Nuclear Isomers of Tellurium,
Mercury and Tin

to the reactions (n, γ) and $(n, 2n)$, radioactive isotopes are formed: Hg^{197} , Hg^{199} , Hg^{203} and Hg^{205} . Because at least six days elapsed until the separation was performed it can be assumed, that in the synthesized initial preparation - mercury diethyl only Hg^{203} , Hg^{197m} and Hg^{199} were present. From the investigations of the Laboratory for Radiochemistry of the University Leningrad (reference 1-6) it results, that the complete aliphatic mercury derivatives may undergo an irreversible destruction of the chemical bondings on isomeric transitions. The isolation of Hg^{197m} in the ground level was performed by means of adsorption on manganese dioxide. The separation from the carrier can be achieved by methods, which are based on the volatility of mercury and its derivatives. The separation of the nuclear isomers as such can be determined from a comparison of the curves of decreasing activity of the mercury preparations (figure 2). When tin is irradiated by thermal neutrons, radioactive nuclei are formed: Sn^{117} , Sn^{119m} , Sn^{117m} and Sn^{119m} by decay). From the three latter ones stable isotopes are produced by an isomeric transmutation: Sn^{117} and Sn^{119} , Sn^{121} , Sn^{123} and Sn^{125} were isolated in the ground

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The Separation of the Nuclear of Tellurium,
Mercury and Tin

28-11/41

state from a benzene solution of stannic tetraphenyl by way of extraction. Because of the fact, that the isomers Sn^{127} and Sn^{125} have no genetic inter-relation, Sn^{127} and $\text{In}^{115\text{m}}$ will pass over into the water layer during the extraction. For this reason the activity measurement was started after the lapse of from 10-12 half life periods of $\text{In}^{115\text{m}}$ ($T = 10^6$ minutes). The decay curve of Sn^{121} is represented by figure 1. The accumulation of Sn^{121} with time was examined (figure 4) for the purpose of proving the genetic relation between Sn^{121} in ground state and $\text{Sn}^{121\text{m}}$. The method described here may be considered the most universal. It makes furthermore possible to isolate the nuclei in a low isomeric state without carriers. There are 4 figures, and 6 references, 4 of which are Slavic.

SUBMITTED: June 18, 1957

AVAILABLE: Library of Congress

Card 4/4

NEFE DOV, V. D.

AUTHORS: Nefedov, V. D. , Toropova, M. A.

TITLE: Isolation of Technetium-99m Without Carrier by Means of
Breaking Chemical Bonds During β -Decomposition
 (Vydeleniye tekhnetsiya-99m bez nositelya metodom razrusheniya
 khimicheskikh svyazey pri β -raspade

PERIODICAL: Zhurnal Neorganicheskoy Khimii, 1990, Vol. 1, Nr 1, pp 231-234
 (USSR)

ABSTRACT: Methods of production of Bi^{210} (RaE), Bi^{210} (ThC), and In^{113m}
 were developed in the works (reference 1 to 3) which are
 based upon the destruction of the co-valent bonds of the ele-
 ment-organic compounds by the processes of the β_+ -decay and
 K-capture. This destruction is a result of both the changes
 in the shells of electrons of the daughter atom in consequence
 of the self-ionization-processes and the inner conversion to-
 gether with the accompanying effect by Czhe , as well as the
 change of the chemical properties of the element. The authors
 count 21 radioactive isotopes (and even more) which can be

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70-1-10/43

Isolation of Technetium-99m Without Carrier by Means of Breaking Chemical Bonds During β^- - Decomposition

isolated from the conversion-chains of the radio-elements due to division, a penetrating separation by the radiation-capture of the neutron, ordinary cyclotron reactions and by the decay into the series without carriers (reference 4 to 6). Continuously operating sources of radioactive isotopes of a number of elements can be produced here in many cases. Mo^{99} as ingredient of hexacarbonyl was used for the problem referred to in the title. Tc^{99} can be produced in metastable state by various nuclear reactions: $Ru^{100}(n,p)Tc^{99m}$, $Th(\phi)Tc^{99m}$, $Mo^{99}(\beta^-)Tc^{99m}$. The latter method was applied here. The irradiation of molybdenum with slow neutrons leads to the formation of several radioactive isotopes, amongst which also is $Mo^{99}(T_{1/2} = 63,5 \text{ hours})$. As mentioned above, the β^- -decay leads to $Tc^{99m}(T_{1/2} = 6,1 - 6,7 \text{ hours})$, which by means of an isomeric transition results in a long-lived technetium-isotope. The decay scheme of Mo^{99} (reference 4) is shown in figure 1. After a brief experimental part the authors pass over to the methods of isolation of Tc^{99m} . Tc^{99m} was extracted with double distilled water from a chloroform-, or ether-solution of hexacarbonyl. Decay curves of the preparations

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78-1-42/43

Isolation of Technetium-99m Without Carrier by Means of Breaking

Chemical Bonds During β -Decomposition

of $\text{Tc}^{99\text{m}}$ produced herewith are shown in figure 3. They prove a radioactive half-life of 6,5 hours (with reference 12 to 14 corresponding to a wide extent). Determination of the yield of $\text{Tc}^{99\text{m}}$. Since stable technetium-isotopes are missing the general method of determination by means of an isotope carrier cannot be applied here. Non-specific carriers, e.g. manganese dioxide, can serve here with sufficient accuracy. It was assumed that the whole Tc^{99} obtained from the decay of Mo^{99} exists in an anorganic form. Sodium permanganate solution in acetone was introduced in a solution of molybdenum-hexacarbonyl irradiated with neutrons. Technetium was adsorbed on the amply developing voluminous MnO_2 -deposit. The activity of the hence obtained centrifugates was measured by means of a γ -counter. The activities determined were compared with those of the initial solution of molybdenum carbonyl in chloroform and of the chloroform solution, which was obtained on account of the extraction of technetium. $\text{Tc}^{99\text{m}}$ was computed according to the formula: $B = \frac{A_0 - A_1}{A_0 - A_L} \dots$

Card 3/4

Nefedov V. D.

CHINA/Physical Chemistry - Kinetics. Combustion. Explosions. Topochemistry. Catalysis. F-9

Abs Jour: Referat Zhur - Khim, No. 9, 1959, 30533

Author : Nefedov, V.D., Wan Wen-ch'ing

Inst : Peking University

Title : The Study of Sb Isotope Exchange in the System
 $(m\text{-CH}_3\text{C}_6\text{H}_4)_3\text{Sb}-(m\text{-CH}_3\text{C}_6\text{H}_4)_3\text{Sb-Cl}_2\text{-C}_2\text{H}_5\text{OH}$

Orig Pub: Beijing Daxue Xuebao (Ziran Kexue)/sic_7, Acta
Sci Natur Univ Pekinensis, No 3, 1958, 314-319

Abstract: The kinetics of isotope exchange in the above-
indicated system have been studied. The follow-
ing values were obtained for the isotope-exchange
rate constant at 40, 50, 60, and 70°; 0.65, 1.3,
2.6, and 4.8 liters/mol-hr. The activation
energy was found to be 14 kcal/mol.--From a
summary by the authors.

Card 1/1

1977, 21(1)

AUTHOR: Nerelov, V. D., Shchegolov, Y. M.

TITLE: The Separation of the Mercury Isotopes Hg^{196} and Hg^{198}
(Razdeleniye yedinyaniy Hg^{196} i Hg^{198})

PERIODICAL: Zhurnal fizicheskoy khimii, 1977, Vol. 51, No. 1,
pp 2392 - 2397 (USSR)

ABSTRACT: The true principle of the chemical separation of the mercury isotopes was first experimentally shown by S. R. H. of the USSR, Chaper (Kheifit, S. R., Chaper, R. S.). It was experimentally proved that the present case the separation of the mercury isotopes of the mercury Hg^{196} and Hg^{198} , as well as Hg^{199} and Hg^{200} is investigated. The initial mixture of the chemically pure metallic mercury was prepared in the uranium reactor. The preparation of the radioactive diethyl mercury was obtained from the irradiated mercury by way of $HgCl_2$, using the Grignard (Grignard) reagent. To separate the Hg^{196} the diethyl mercury was diluted with acetone (1:3), and a $KMnO_4$ solution

Page 3

The Separation of the Nuclear Isomers Hg^{199m} and Hg^{199}

NEFEDOV, V.D.; SINOTOVA, Ye.N.; SMIRNOV, V.M.; TOROPOVA, M.A.

Enrichment of radiophosphorus by means of triphenylphosphine
oxide. Radiokhimiia 1 no.2:236-238 '59. (MIRA 12:8)
(Phosphorus--Isotopes) (Phosphine oxide)

COUNTRY : China R-7
 CATEGORY : Physical Chemistry--Radiochemistry. Isotopes.
 RES. JOUR. : RZKhim., No. 1960, No. 1960
 AUTHOR : Nefedov, V. D., Liu Yuan-fong, Li Wang-ch'ang, and
 NOT. : Not given
 TITLE : Investigation of the Chemical State of RaE (ob-
 tained by β -decay from the RaD in $[(C_6H_5)_3Pb]_2$,
 $(C_6H_5)_3Pb(NO_3)_2$, and $(C_6H_5)_3PbNO_3$
 ORIG. PUB. : Hua Hsueh Hsueh Pao (Acta Chim Sinica), 25, No. 3,
 165-170 (1959)
 ABSTRACT : The authors have investigated the chemical state
 [sic] of RaE obtained by β -decay of the RaD in
 the following phenyl-derivatives of lead:
 $[(C_6H_5)_3Pb]_2$, $(C_6H_5)_3Pb(NO_3)_2$, and $(C_6H_5)_3PbNO_3$.
 The effect of the chemical form of the mother sub-
 stance and of the conditions under which the RaE
 is accumulated on the chemical state of the daugh-
 ter substance has been investigated.
 From authors' summary
 * Lung Yung-hua
 CARD: 1/1

5(3)

AUTHORS: Murashov, G. M., Nefedov, V. D., Skorobogatov, G. A.,
Smirnov, V. M. SOV/79-29-9-13/76

TITLE: Investigation of the Synthesis Mechanism of Alcohols According
to Grignard by Means of Tagged O

PERIODICAL: Zhurnal obshchey khimii, 1959, Vol 29, Nr 9, pp 2864-2868 (USSR)

ABSTRACT: As proven by A. N. Nesmeyanov and V. A. Sazonova (Ref 1), a
hydrolysis of carbinolates must take place in the final stage
of reaction in the synthesis of alcohols and carboxylic acids
according to Grignard. Two entirely different reaction courses
are possible in this connection. In the synthesis of alcohols
the hydrolysis of carbinolates may occur either by the cleavage
of the bond between the alkyl group and the oxygen atom:

$R-O-MgHal + HO^*H \longrightarrow R-O^*H + Mg(OH)Hal$ (I), or by the
cleavage of the bond between the magnesium- and oxygen atoms

$R-O-MgHal + HO^*H \longrightarrow R-OH + Mg(O^*H)Hal$ (II). There are but
scarce mentions in publications concerning the investigation
of Grignard's reactions by the aid of isotopes (Ref 2). Some
authors (Ref 3) consider a magnesium isotope exchange between
the Grignard reagent and the magnesium halides to be possible;

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SOV/79-29-9-13/76

Investigation of the Synthesis Mechanism of Alcohols According to Grignard
by Means of Tagged O

still, the isotope exchange between CH_3MgBr and $\text{Mg}^{28}\text{Br}_2$, for example, did not yield any positive results (Ref 4). Finally, an investigation by means of deuterium was made of the reducing action of the Grignard reagent in the reduction of benzophenone in benzohydrol under the action of isobutyl magnesium bromide (Ref 5). Nothing has yet been published concerning the rearrangement of oxygen in the synthesis of alcohols and carboxylic acids. An attempt was made in the investigation under review to explain whether reaction (I) or (II) takes place in the hydrolysis of carbinolates. The initial step was the synthesis of triphenyl carbinol by the reaction of benzophenone with phenyl magnesium bromide (Scheme 3), and the hydrolysis of carbinolate of magnesium was shown to take place with the preservation of the alkyl-oxygen bond and with the separation of the metal-oxygen bond. The reaction water was investigated for O^{18} according to A. I. Brodskiy (Ref 7) in the mass spectrometer of type MS-1. There are 1 table and 11 references, 5 of which are Soviet.

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SOV/79-29-9-13,'76

Investigation of the Synthesis Mechanism of Alcohols According to Grignard
by Means of Tagged O

ASSOCIATION: Leningradskiy gosudarstvennyy universitet
(Leningrad State University)

SUBMITTED: September 21, 1958

Card 3/3

NEFEDOV, V. P., ZAYITSEV, V. M., GRACHEV, S. A., MUREN, A. N. (USSR)

"Use of Chemical Changes Accompanying Processes of Beta-Decay of Ra²²⁶ for the Synthesis of Organic Compounds of Polonium".

paper submitted for the Symposium on the Chemical Effects of Nuclear Transformation (IAEA) Prague, 24-27 Oct. 1960.

NEFEDOV, V. D., RYUKHIN, YI. A., TOROPOVA, M. A., MELNIKOV, V. N., LI-THI-MIN (USSR)

"Study of Isotope Effects in Beta-Decay of Natural Isotopes of Lead".

paper submitted for the Symposium on the Chemical Effects of Nuclear Transformation
(IAEA) Prague, 24-27 Oct. 1960.

PHASE I BOOK EXPLOITATION SOV/5404

Murin, A. N., V. D. Nefedov, and V. P. Shvedov, eds.

Radiokhimiya i khimiya yadernykh protsessov (Radiochemistry and the Chemistry of Nuclear Processes) Leningrad, Goskhimizdat, 1960. 784 p. Errata slip inserted. 13,000 copies printed.

Ed.: F. Yu. Rachinskiy; Tech. Ed.: Ye. Ya. Erlikh.

PURPOSE : This textbook is intended for students of physical chemistry or radiochemistry at universities and schools of higher education. It may also serve as a handbook for scientific workers and technical personnel in the radiochemical industries and other related branches.

COVERAGE: The textbook deals with problems in modern radiochemistry, including adsorption, cocrystallization, isotope exchange in radioactive elements, the chemistry of nuclear processes, and methods of preparing radioactive isotopes and labeled compounds. Special attention has been given to chemical processes caused by radioactive transformations and radiation. In the main the book was compiled by person-

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Radiochemistry and the Chemistry (Cont.)

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nel of the Radiochemistry Department, Leningradskiy gos-
udarstvennyy universitet imeni A. A. Zhdanova (Leningrad
State University imeni A. A. Zhdanov), and the Department of
the Technology of Artificial Radioactive Isotopes, Lenin-
gradskiy tekhnologicheskii institut imeni Lensovet (Lenin-
grad Technological Institute imeni Lensovet). No person-
alities are mentioned. References accompany individual
chapters.

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MEFEDOV, V.D.; RYUKHIN, Yu.A.; TOROPOVA, M.A.

Study of isotope effects taking place in the course of the
 β -decay of natural lead isotopes. Radiokhimiia 2 no.4:458-463
'60. (MIRA 13:9)
(Lead--Isotopes)

MEFEDOV, V.D.; GRACHEV, S.A.

Paper chromatographic study of the chemical forms of RaE formed
in the β -decay of RaD. Radiokhimiia 2 no. 4:464-469 '60.

(MIRA 13:9)

(Lead--Isotopes)

(Bismuth--Isotopes)

S/186/60/002/006/021/026
4051/A129

AUTHORS: Nefedov, V. D.; Sinotova, Ye. N.; Trenin, V. D.

TITLE: A study of the isotope exchange in the system
 $\text{Bi}^*(\text{C}_6\text{H}_5)_3 - \text{Bi}(\text{C}_6\text{H}_5)_3\text{Cl}_2$ - alcohol.

PERIODICAL: Radiokhimiya, v. 2, no. 6., 1960, 739 - 742

TEXT: The kinetics of isotope exchange was investigated and the reaction rate constants of this exchange were determined, as well as the order of reaction and energy of activation. The exchange kinetics were studied in order to obtain a clearer understanding of the behavior of radioactive bismuth forms in the exchange during the beta-decay processes of the natural bismuth isotope. The initial compounds were obtained according to methods described in Ref. 4 (K. A. Kocheshkov, A. P. Skoldinov, Sintet. metody v oblasti metallorgan. soyedineniy sur'my i vismuta. (Synthetical methods in the field of metallorganic antimony and bismuth compounds) Izd. AN SSSR, M.-L., 8, 1947). The solubility of bismuth triphenyl and bismuth triphenyldichloride in alcohol at various temperatures was investigated in order to determine the conditions of separation of

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A study of the isotopes exchange in

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the exchanging compounds. The isotope exchange in the given system was studied according to the method described by the author (Ref. 1: V. D. Nefedov; Tao Syao-en, Zhurn. Pekinsk. univ., 4, 383, 1959). The experimental results showed that the reaction of isotope exchange in the given system is of the first order with respect to each of the components. The reaction rate constants were calculated from the formula:

$$K = \frac{-2.3 \lg (1 - F)}{(a + b) t},$$

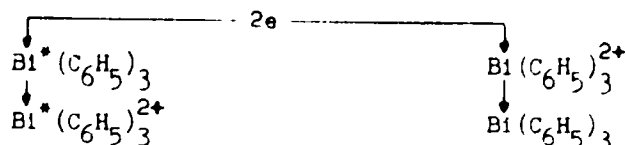
where F is the degree of exchange. a - the concentration of $\text{Bi}^*(\text{C}_2\text{H}_5)_3$ or $\text{Bi}(\text{C}^{14}\text{C}_5\text{H}_5)_3$ (in M), b - the concentration of $\text{Bi}(\text{C}_6\text{H}_5)_3\text{Cl}_2$ (in M), t - the time of exchange (in hours). The activation energy was found to be equal to 15.900 cal/mole. The investigated compounds were regarded as pseudoatoms and their derivative (Ref. 5: R. Garzov, L. Grimm. Organometalle. Sammlung chem. techn. Vortraege, 29. Stuttgart, 1927). From this stand point one of the compounds participating in the exchange ($\text{Bi}(\text{C}_6\text{H}_5)_3$) is regarded as a pseudoatom of mercury, and the other ($\text{Bi}(\text{C}_6\text{H}_5)_3\text{Cl}_2$) as its salt. Thus, the investigated case of isotope exchange is considered to be a true solution of a pseudometal and its salt. An

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assumption is made that the isotope exchange in the given system has an electro-
nic nature, whereby the electrons shift according to the scheme:



It ensures the isotope exchange of Bi amongst the studied chemical forms. The low value of the activation energy is also thought to signify the presence of an electronic exchange. The use of doubly-labelled compounds can serve to solve the nature of the exchange mechanism in the given system and others similar to it. A comparison of the kinetic characteristics of the isotope exchange in the systems $\text{Sb}(\text{C}_6\text{H}_5)_3$ - $\text{Sb}(\text{C}_6\text{H}_5)_3\text{Cl}_2$ - alcohol and $\text{Bi}(\text{C}_6\text{H}_5)_3$ - $\text{Bi}(\text{C}_6\text{H}_5)_3\text{Cl}_2$ - alcohol led to the conclusion that the isotope exchange in these two systems have similar rates of reaction. The cause of the similarity in the kinetics of exchange in the two systems is thought to be due to similar values of the bond energies of the 5s-electrons in the pseudoatom $\text{Sb}(\text{C}_6\text{H}_5)_3$ and that of the 6s-electrons of the

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A study of the isotope exchange in

pseudoatom $\text{Bi}(\text{C}_6\text{H}_5)_3$. A study of other similar systems, such as $\text{As}(\text{C}_6\text{H}_5)_3$ -
- $\text{As}(\text{C}_6\text{H}_5)_3\text{Cl}_2$, is recommended in order to clarify this question. There are
4 tables, 4 figures and 5 references: 4 Soviet-bloc and 1 non-Soviet-bloc.

SUBMITTED: September 19, 1959.

Card 4/4

81723

S/020/60/133/01/34/070
B011/B003

5 2500
5 3700(B)

AUTHORS: Murin, A. N., Nefedov, V. D., Zaytsev, V. M., Grachev, S. A.

TITLE: Synthesis of Elemental-organic Compounds of Polonium by
Using Chemical Changes Taking Place During the Processes
of Beta Decay of RaE₁₉

PERIODICAL: Doklady Akademii nauk SSSR. 1960. Vol. 133. No. 1.
pp. 123 - 125

TEXT: The ability of the elements polonium, francium, and astatine to form elemental-organic compounds is a result of their position in the periodic system and of a general law discovered by D. I. Mendeleev. This law was newly formulated by Academician A. N. Nesmeyanov (Refs. 1 and 2). The present paper describes the development of new methods of synthesizing the compounds mentioned in the title, which had been unknown so far. The method based on the utilization of chemical changes occurring during β -decay might be useful in this case (Refs. 7-11 for bismuth). The authors prove that the said polonium compounds (RaF) are formed by β -decay of RaE. RaE is a component of several aromatic

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Synthesis of Elemental-organic Compounds of Polonium by Using Chemical Changes Taking Place During the Processes of Beta Decay of RaE

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derivatives. Polonium was accumulated in crystals of Bi(RaE)Rh_3 and $\text{Bi(RaE)Ph}_3\text{Cl}_2$. In order to obtain these compounds with a sufficiently high specific activity, the authors made use of chemical changes occurring during the β -decay of RaD which is contained in RaDPh_4 . The main problem was the isolation and identification of the compounds of the daughter elements of polonium (RaF), for which purpose the authors used paper chromatography. Analogous derivatives of tellurium, TePh_2 , TePh_2Cl_2 , and TePh_3Cl , labeled with Te^{127} , were used to determine the position of individual elemental-organic polonium compounds on the chromatogram. These Po compounds were separated in the presence of microquantities (μg) of these carriers. Results of measurement are shown in Fig. 1. The following values were obtained for the above-mentioned tellurium compounds in ethyl acetate: R_f : $\text{TePh}_3\text{Cl} \sim 0.1$; TePh_2Cl_2 0.50 - 0.55; TePh_2 0.70 - 0.75. The following values were obtained in

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Synthesis of Elemental-organic Compounds of
Polonium by Using Chemical Changes Taking
Place During the Processes of Beta Decay of RaE

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CCl_4 (without treatment of the paper): R_f : TePh_3Cl 0; TePh_2Cl_2 0.6 - 0.7;
 $\text{TePh}_2 \sim 1$. Fig. 2 shows the distribution of the α -activity among various
chemical modifications of polonium on accumulation in Bi(RaE)Ph_3 crys-
tals: PoPh_2Cl_2 15 \pm 6%; PoPh_2 24 \pm 6%, and the sum of the remaining Po de-
rivatives was 61 \pm 6%. Data are also given for CCl_4 and petroleum ether.
Fig. 3 shows the results of chromatographing in ethyl acetate ($R_f = 0.54$).

It may be seen that the chemical state has a strong effect on the yields
of various RaE forms. This makes it possible to utilize chemical changes
occurring in β -decay for the synthesis of the Po compounds mentioned in
the title. The authors thank G. A. Razuvaev, Corresponding Member of
the AS USSR, and B. K. Preobrazhenskiy for their advice. There are
3 figures and 15 references: 9 Soviet, 1 American, 4 German and
1 Chinese.

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Synthesis of Elemental-organic Compounds of Polonium by Using Chemical Changes Taking Place During the Processes of Beta Decay of RaE

81723
8/020/60/133/01/34/070
B011/B003

ASSOCIATION: Leningradskiy gosudarstvennyy universitet im. A.A. Zhdanova
(Leningrad State University imeni A. A. Zhdanov)

PRESENTED: March 10, 1960, by A. N. Nesmeyanov, Academician

SUBMITTED: March 8, 1960

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S/186/61/003/001 016/020
A051/A129

21.3200

AUTHORS: Murin, A.N., Nefedov, V.D., Larionov, O.V.

TITLE: The separation of nuclear isomers of tellurium

PERIODICAL: Radiokhimiya, v 3, no 1, 1961, 90-96

TEXT: The authors have developed a new method for the separation of nuclear isomers of tellurium and the separation of lower isomer compound states without a carrier, as well as a method for the separation of radio-chemically pure Te^{127} from irradiated tellurium dimethyldinitrate with neutrons (and γ -quanta). They show that the extraction of Te^{127} from the irradiated sample reaches a yield close to 100%, which corresponds to the break of the chemical bond in each converted isomer transition. The greater part (about 91%) of the extracted Te^{127} is in the lower tetra-valent state and only about 9% is in the hexa-valent state. The initial compound used for the separation of the main isomer state of tellurium was tellurium dimethyldi-

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A051/A129

The separation of nuclear isomers of tellurium

nitrate $(\text{CH}_3)_2\text{Te}(\text{NO}_3)_2$. The latter was formed from tellurium dimethyldiiodine: $\text{Te} + 2(\text{CH}_3)_2\text{I} \rightarrow (\text{CH}_3)_2\text{TeI}_2$. The authors investigated various ways of isolating Te in the basic state: 1) extraction of the basic salts of Mn on the residue formed when an alcohol solution of $\text{Mn}(\text{CH}_3\text{COO})_2$ is added to the acetone solution $(\text{CH}_3)_2\text{Te}(\text{NO}_3)_2$ was found to be inconvenient, since the residue retained most of the initial quantity of the compound; 2) extraction on the residue of H_2WO_4 gave a small yield; 3) extraction on MnO_2 was impossible due to oxidation of the initial compound and dissolution of MnO_2 ; 4) extraction on the metal hydroxides (Fe, Bi) gave the highest yield of Te in the basic state. The authors adopted the Te isolation method on iron hydroxide. The curve of Fig 3 shows that there is only one isotope with a half-life of 9.3 hours, which proves the presence of Te^{127} in the sample in the basic state. The degree of impurities was studied using metastable Te^{127m} , whereby the decay of the Te^{127} samples was investigated (Fig 2). Further, the radiochemical purity of samples produced according to the authors' methods was compared to that produced according to the methods of Siborg, Livinhood and Kennedy. The average yield was found to be $79.5 \pm 2.2\%$

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The separation of nuclear isomers of tellurium

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when accumulated in crystals. The high yields noted by the authors are thought to be the result of the sharply expressed irreversibility of the occurring chemical changes during isomer transition when using $(CH_3)_2Te(NO_2)_2$. The data of Table 2 show that with an accumulation of Te in the crystals the yield of the basic state is somewhat less since in this case there is a greater stability of the basic state of Te^{127} in the form of the initial tellurium dimethyldinitrate compound. The difference in the chemical behavior of the tetra and hexa-valent states of Te helps to solve the problem of Te distribution between these valency states. The study of this question was carried out by the isotopes carrier method corresponding to various chemical compounds (TeO_2 and H_2TeO_4). The separation of the 6- and 4-valent Te was based on the reduction of the latter to the elemental state by sulfur dioxide in a 3 n solution of HCl (Ref 12). The average yields are equal to $8.5 \pm 1.2\%$ and $91.5 \pm 1.2\%$, respectively. The fact that most of Te^{127} is in the lower valency state is explained by secondary processes which occur after the above-mentioned phenomena. The activation of Te in the main state was conducted on a betatron and the separation of Te in the main state was carried out according to the reaction (γ, n) (Fig 4). There are 4 figures, 4 tables and 14 references: 6 Soviet-bloc, 8 non-Soviet-bloc.

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23003

S/186/61/003/002/015/018
E111/E452

24.6720(1482, 1563, 1138)

AUTHORS: Nefedov, V.D., Vykhovtsev, V.L., Chi-Lan, Wu and
Grachev, S.A.

TITLE: Chemical changes occurring in β -decay of RaD which
is part of the composition of radical-deficient
derivatives of lead

PERIODICAL: Radiokhimiya, 1961, Vol.3, No.2, pp.225-228

TEXT: The authors note the complicated nature of changes
occurring in the β -decay of the central atom of organic
derivatives of lead. It was shown (Ref.1: V.D.Nefedov,
V.I.Andreyev, ZhFKh, 31, 3, 563 (1957) and Ref.2: V.D.Nefedov,
M.P.Bel'dy, ZhFKh, 31, 3, 986 (1957)) that with excess-radical
and radical equivalent phenyl derivatives of RaD and ThB the
bismuth isotopes produced on their decay can form a whole
series of compounds. Their origin is complex and can be
primary (due to rearrangement of the original molecule in β -decay
processes not accompanied by internal conversion), secondary
(due to recombination of fragments produced in β -decay processes
accompanied by internal conversion) or tertiary (due to
redistribution of daughter elements between compounds due to
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X

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E111/E452

Chemical changes ...

chemical processes during analysis). It is difficult to establish the participation of adjacent molecules in some of the changes taking place. A possible way of solving this important problem is to study the chemical state of daughter atoms produced in the decomposition of radical-deficient lead derivatives (i.e. compounds whose molecules contain insufficient radicals to form the highest organic derivatives of bismuth, e.g. PbPh_2Cl_2). If appreciable quantities of such organic bismuth derivatives appear in the decomposition products, this would indicate that neighbouring molecules participate, and conversely. The problem is thus to compare the quantities of complete organic bismuth derivatives formed in the decomposition of, on the one hand, radical-equivalent and radical-surplus and, on the other hand, radical-deficient derivatives. The authors studied this with RaDPh , RaDPh_3Cl and $\text{RaDPh}_2\text{Cl}_2$. They used the isotope-carriers method (described in Ref.1 and 2) to study first the compounds of RaE formed during accumulation in crystals of RaDPh_4 and RaDPh_3Cl . The proportion of RaE existing as RaEPh_3 was determined by the precipitation and by the solvent-removal methods. In the first, the $\text{Pb(RaD)Ph}_3\text{Cl}$ or

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Chemical changes ...

Pb(RaD)Ph₄ was dissolved in 15 ml of pyridine containing about 400 mg BiPh₃ and 5 ml of BiPh₃Cl₂. The precipitate obtained on adding 30 ml of distilled water was filtered off and washed with water and then with two 10 ml portions of alcohol. After drying ether extraction was effected, the extract being filtered and evaporated. The Bi(RaE)Ph₃ residue was purified by recrystallization. In the solvent removal method, about 35 mg of Pb(RaD)Ph₃Cl or Pb(RaD)Ph₄ was dissolved as before, but the pyridine was removed by a stream of cold air; the residue was extracted with ether, the Bi(RaE)Ph₃ obtained after removal of ether being purified as before. Similar procedure was used for RaE existing as RaEPh₃Cl₂. The two methods were also used for RaE compounds formed on accumulation in crystals of Pb(RaD)Ph₂Cl₂, but here warm pyridine was used. Special experiments showed that among the causes of discrepancies between the result of the two methods are tertiary changes. The results show that chemical changes in β -decay of the central atom (RaD) in element-organic derivatives of lead RaDPh₄, RaDPh₃Cl and RaDPh₂Cl₂ do not draw in surrounding molecules. Acknowledgments are expressed to A.N.Murin who made valuable suggestions on this work. There are Card 3/4



Chemical changes ...

23003

S/186/61/003/002/015/018
E111/E452

2 tables and 5 references: 3 Soviet-bloc and 2 non-Soviet-bloc.
The reference to the English language publication reads as follows:
R.R. Edwards, J.M. Day, R.E. Overman, J. Chem. Phys., 21, 9, 1555 (1953).

SUBMITTED: October 16, 1959

Card 4/4

23001

5.2500(1160, 1273, 1350)

S/186/61/003/002/016/018
E142/E435

AUTHORS: Nefedov, V.D. and Skorobogatov, G.A.

TITLE: On multiply tagged compounds

PERIODICAL: Radiokhimiya, 1961, Vol.3, No.2, pp.229-236

TEXT: Compounds in which the essential (if not all) the activity is to be found in the molecules containing at the same time a few tagged atoms are called multiply tagged compounds. The difference between simple tagged compounds and their mixtures and multiply tagged compounds is of great importance since in some respects the behaviour of the latter differs sharply from that of simple tagged compounds. A different nomenclature should therefore be used for the two classes of compounds; a few examples of different types of writing the formulae of simple and multiply tagged compounds are given. According to K.Clusius (Z.Elektrochem., 58, 7, 586 (1954), the authors designate compounds consisting entirely of isotope molecules of a given type "isotope compounds" and compounds consisting entirely of isotope-isomer molecules of a given type "isotope isomers". Multiply tagged compounds, diluted by a certain amount of inactive substance, have a non-statistical distribution of the isotope atoms and are therefore thermodynamically

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23004

X

On multiply tagged compounds

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unstable systems. The authors discuss the importance of these multiply tagged compounds for certain chemical investigations as for instance the reaction mechanism of the isotope exchange between triphenyl antimony and triphenyl dichloro-antimony (Ref.2: V.D.Nefedov, Pang Wen-Ch'ing, Acta Sci.Nat.Univ.Pekinensis, 319 (1950)) or for establishing the nature of intermediate complexes. Difficulties in the synthesis of these multiply tagged compounds are discussed especially the need for knowing exactly the initial concentration of the isotopes in the samples since otherwise it is not possible to calculate the yields of the various isotope molecules of the synthesized compound and to carry out mass spectrometric analysis. Any individual chemical compound represents in itself a mixture of isotope compositions and these, in turn, represent a mixture of isotope isomers. Formulae expressing the content of isotope-isomer molecules can easily be deduced. The kinetics of the radioactive decomposition of multiply tagged compounds and the agglomeration of the products of this decomposition were also studied. The molecule which is obtained during the decomposition of one of the radioactive atoms of

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On multiply tagged compounds

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the multiply tagged molecule is also tagged and can therefore undergo further decomposition. Formulae of the decomposition of the molecule are derived and the conditions for maximum yield of isotope compounds are determined. A.D.Petrov is mentioned. There are 1 figure and 6 references: 4 Soviet-bloc and 2 non-Soviet-bloc. The reference to an English language publication reads as follows: R.L.Wolfgang, R.C.Anderson, R.W.Dodson, J.Chem.Phys., 24, 1, 15 (1956).

SUBMITTED: September 19, 1959

X

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